

FORAGE SUITABILITY GROUP

Limy Upland

FSG No.: G106XY400NE

Major Land Resource Area: 106X -Nebraska and Kansas Loess-Drift Hills

Physiographic Features

These soils are found on uplands.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1000	1650
Slope (percent):	6	30
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Very low	High

Climatic Features

Annual precipitation varies widely from year to year in MLRA 106. Average annual precipitation for all climate stations listed below is about 34 inches. About 71 percent of that occurs during the months of April through September. On average there are about 35 days with greater than .1 inches of precipitation during the same time frame. Annual precipitation and temperature increase from the north to the south in the MLRA.

Average annual snowfall ranges from 16 inches at Wamego, KS to 37 inches at Wahoo, NE. Snow cover at depths greater than 1 inch range from 10 days at Holton, KS to 42 days at Auburn, NE.

Average July temperatures are about 79 degrees F., and average January temperatures are about 25 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -31 at Waho, NE, and a high of 110 recorded at Auburn and Pawnee City in Nebraska and also at Centralia and Holton in Kansas.. The MLRA lies mostly in USDA Plant Hardiness Zones 5a and 5b.

At Topeka, KS, the average annual wind speeds are about 9.7 MPH. The highest wind speeds occur during February though May. It is cloudy about 154 days a year. Average morning relative humidity in June is about 87 percent and average afternoon humidity is 62 percent.

At Lincoln, NE, the average annual wind speeds are about 10.1 MPH. The highest wind speeds occur during March and April. It is cloudy about 149 days a year. Average morning relative humidity in June is about 83 percent and average afternoon humidity is 58 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data access the National Water and Climate Center at

<http://www.wcc.nrcs.usda.gov>.

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	162	201
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	Apr 29	Apr 15
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 10	Apr 22

First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 20	Oct 15
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Oct 01	Oct 26
	From	To
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	140	183
Growing Degree Days (40 deg):	5742	6961
Growing Degree Days (50 deg):	3881	4376
Annual Minimum Temperature:	-20	-10
Mean annual precipitation (inches):	30	39

Monthly precipitation (inches) and temperature (F):

2 years in 10:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precip. Less Than	0.25	0.24	0.85	1.36	2.58	1.84	1.69	1.79	1.52	0.83	0.49	0.35
Precip. More Than	1.99	1.61	3.94	4.95	6.62	8.42	6.02	5.71	6.87	5.10	3.62	2.69
Monthly Average:	0.81	0.92	2.38	3.03	4.47	5.00	3.74	4.06	4.18	2.81	1.72	1.19
Temp. Min.	10.8	15.7	27.1	39.6	50.7	60.4	65.5	62.4	52.8	40.3	28.3	15.8
Temp. Max.	39.2	44.7	56.8	68.9	77.4	85.7	91.3	89.4	81.3	70.9	55.5	42.3
Temp. Avg.	25.4	30.7	42.1	54.6	64.5	73.6	78.6	76.1	67.6	56.4	42.2	29.4

Climate Station	Location	From	To
KS1408	Centralia, KS	1961	1990
KS3759	Holton, KS	1961	1990
KS4559	Lawrence, KS	1961	1990
KS8563	Wamego, KS	1961	1990
NE0435	Auburn, NE	1961	1990
NE6570	Pawnee City, NE	1961	1990
NE8395	Syracuse, NE	1961	1990
NE8905	Wahoo, NE	1961	1990

Soil Interpretations

This group consists of well to somewhat excessively drained, moderately fine to medium textured soils formed from calcareous loess and glacial till, and residuum from calcareous shales. Permeability is moderate, and available water capacity is high.

Drainage Class:	Well drained	To	Somewhat excessively drained
Permeability Class: (0 - 40 inches)	Moderately slow	To	Moderate
Frost Action Class:	Moderate	To	High

	Minimum	Maximum
Depth:	10	
Surface Fragments >3" (% Cover):	0	0
Organic Matter (percent): (surface layer)	0.5	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	0
Sodium Absorption Ratio: (0 - 12 inches)	0	0
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	2	13

Calcium Carbonate Equivalent (percent):
(0 - 12 inches)

0

45

Soil Series List

Bendena	Kipson	Ida
Clime	Steinaer	
Crofton	Tuttle	

Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed on the web at <http://plants.usda.gov/>.

Cool Season Grasses

<u>Symbol</u>	
THIN6	F
THIN6	G
BRINI2	F
LOAR10	F
THPO7	F

Warm Season Grasses

Big bluestem	ANGE	F
Indiangrass	SONU2	F
Little bluestem	SCSC	G
Sideoats grama	BOCU	G
Switchgrass	PAVIV	F

Legumes

Alfalfa	MESA	F
Cicer milkvetch	ASCI4	F
Red clover	TRPR2	F

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

Production Estimates

Production estimates listed here should only be used for making general management recommendations. On site production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields, and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from to 50 percent.

Forage Crop

Management Intensity

	<u>Low</u>	<u>High</u>
	(lbs/ac)	(lbs/ac)
Alfalfa	6600	15400
Alfalfa/Cool Season Grass	4000	12900
Big bluestem	3400	12900
Smooth brome	4000	9100
Switchgrass	3100	10300
Tall fescue	3400	8300

Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

Growth Curve Number: NE0601

Growth Curve Name: Alfalfa

Growth Curve Description: Alfalfa - MLRAs 107, 106, 75, irrigated 73, 72

<u>Percent Production by Month</u>											
<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	10	25	25	20	15	5	0	0	0

Growth Curve Number: NE0602

Growth Curve Name: Cool-season grass

Growth Curve Description: Cool-season grass fertilized early - MLRAs 107, 106, 75, irrigated 73, 72

<u>Percent Production by Month</u>											
<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	5	10	35	30	5	5	10	0	0	0

Growth Curve Number: NE0603

Growth Curve Name: Warm-season grass

Growth Curve Description: Warm-season grass - statewide

<u>Percent Production by Month</u>											
<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	15	30	30	15	5	0	0	0

Growth Curve Number: NE0604

Growth Curve Name: Eastern gamagrass

Growth Curve Description: Eastern gamagrass - statewide

<u>Percent Production by Month</u>											
<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	10	35	40	15	0	0	0	0	0

Soil Limitations

Lime

- The primary limitation to the soils in this group is the high lime content close to the soil surface. This reduces species choices and yield potential.

Management Interpretations

Lime

- When establishing new stands select forage species that are tolerant to the high lime levels inherent to these soils.

Slope

- Safe equipment operation is needed on steeper slopes.

Water erosion

- Include sod forming grass species in new seedings on steeper slopes to reduce sheet and rill erosion. Incorporate erosion control practices during the establishment period. Locate fences, lanes, water developments, and mineral areas to reduce livestock trailing perpendicular to steeper slopes.

FSG Documentation

Similar FSGs:

FSG ID

G106XY100NE

FSG Narrative

Loamy soils do not have as high a lime content near the surface and are more productive.

Inventory Data References:

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas
Natural Resources Conservation Service (NRCS) National Water and Climate Center data
USDA Plant Hardiness Zone maps
National Soil Survey Information System (NASIS) database for soil surveys in Nebraska and Kansas counties in MLRA 106
Nebraska and Kansas NRCS Field Office Technical Guide
NRCS National Range and Pasture Handbook
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

State Correlation:

This site has been correlated with the following states:

KS

NE

Forage Suitability Group Approval:

Original Author: Tim Nordquist

Original Date: 3/6/01

Approval by:

State Range Management Specialist

Date

State Range Management Specialist

Date